BASICS IN OBSTETRICS

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PROFESSOR AND HOD
DEPARTMENT OF OBG

Differential Diagnosis of Pregnancy

- Distended bladder
- Pseudocyesis
- Ovarian cyst
- Fibroid uterus
- Encysted peritonitis

Ovular period

- The first 28 days from LMP or 2 weeks after ovulation/fertilisation

Embryonic period

- Period from 29th day (5th week from LMP) to 69 days (9 weeks and 6 days) from LMP

Foetal period

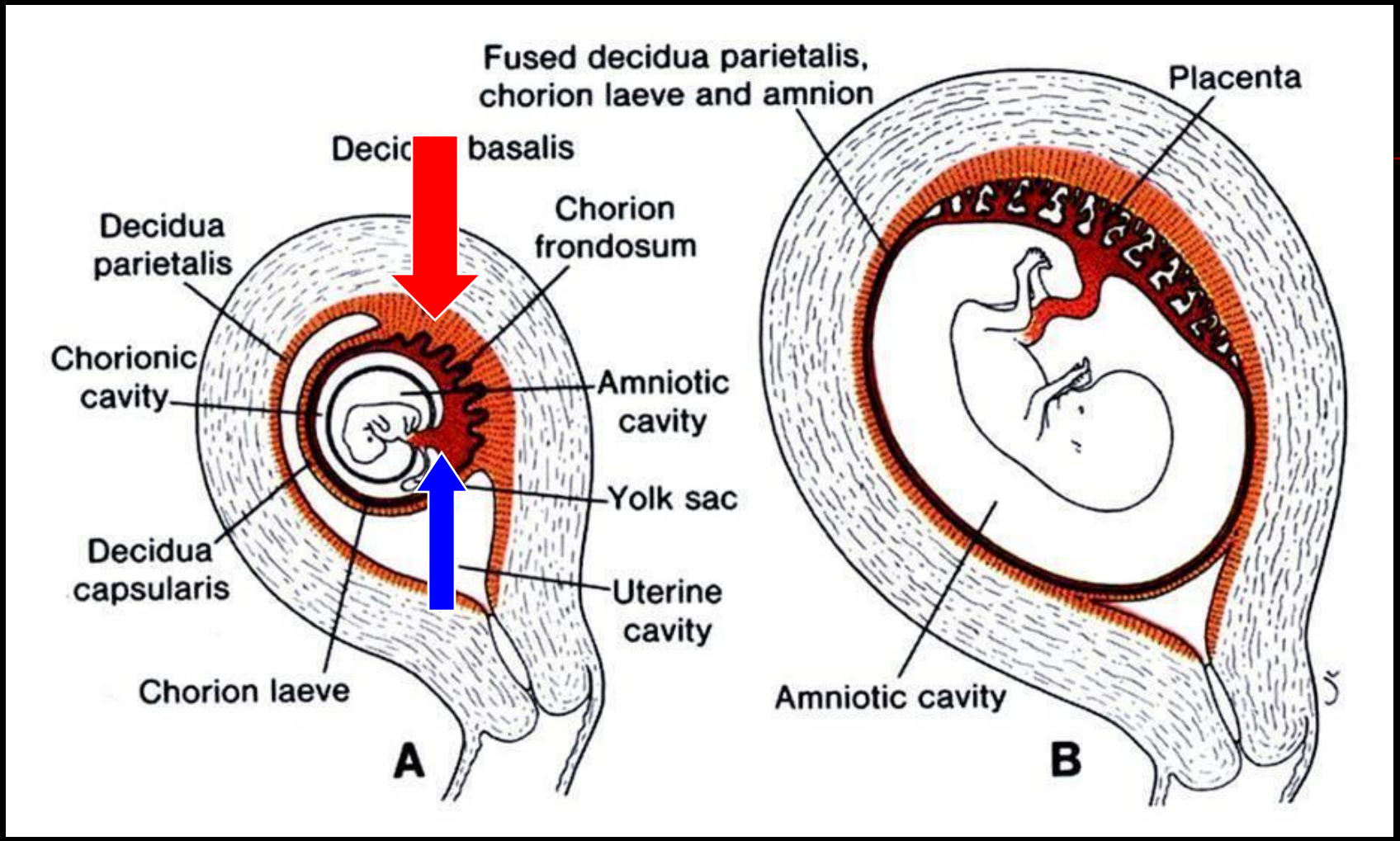
- Period from 70th day of LMP (10th week of LMP) till delivery

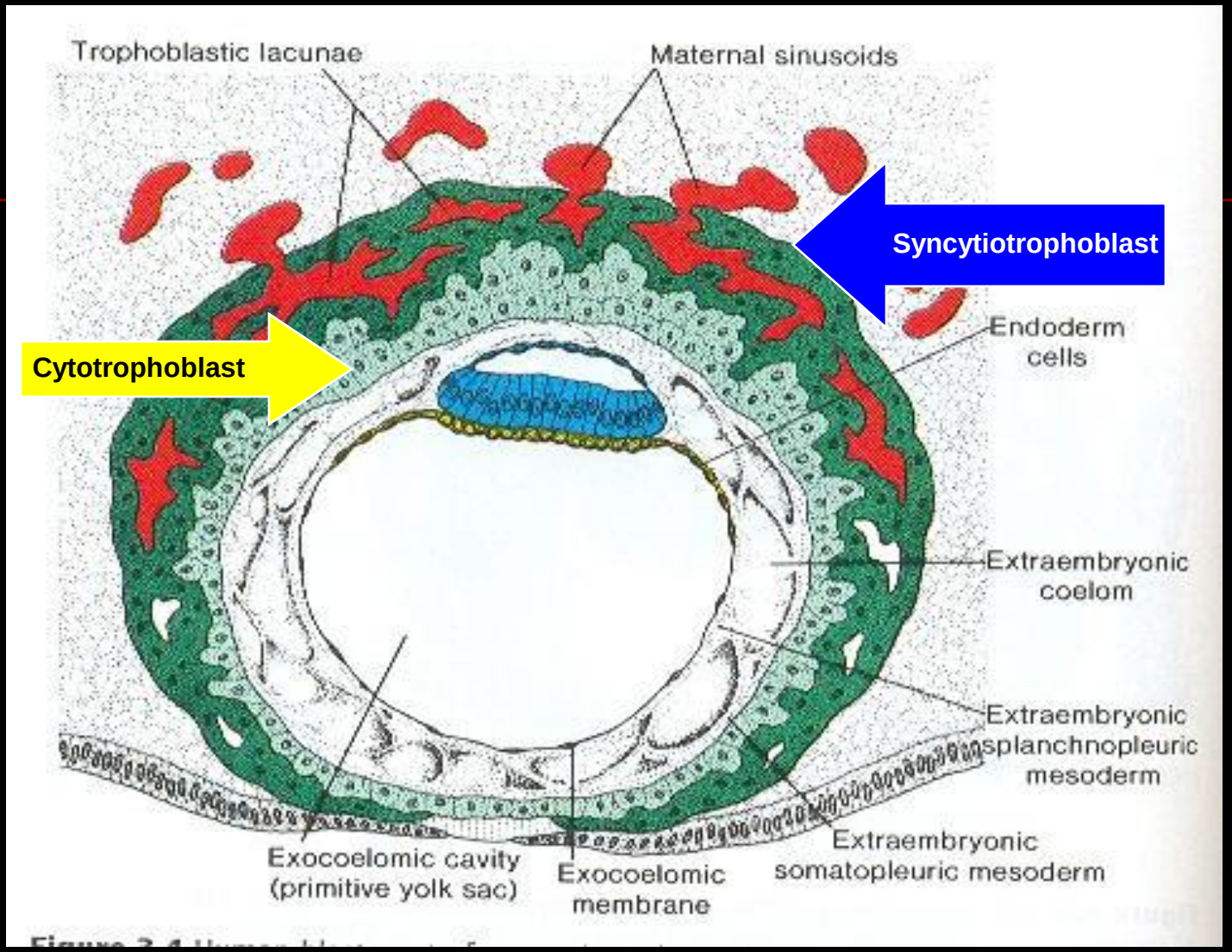
Period of organogenesis

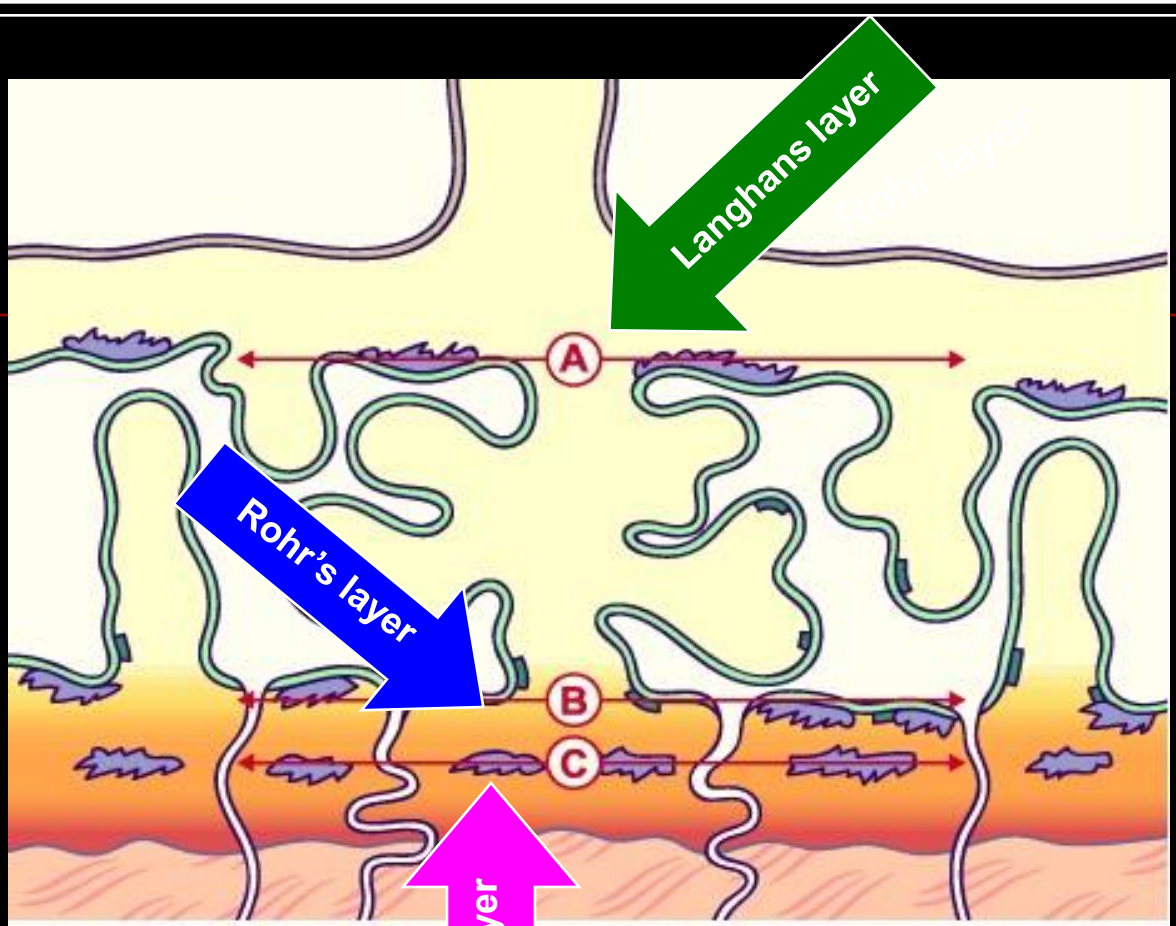
- First 4 months of conception

Development of placenta

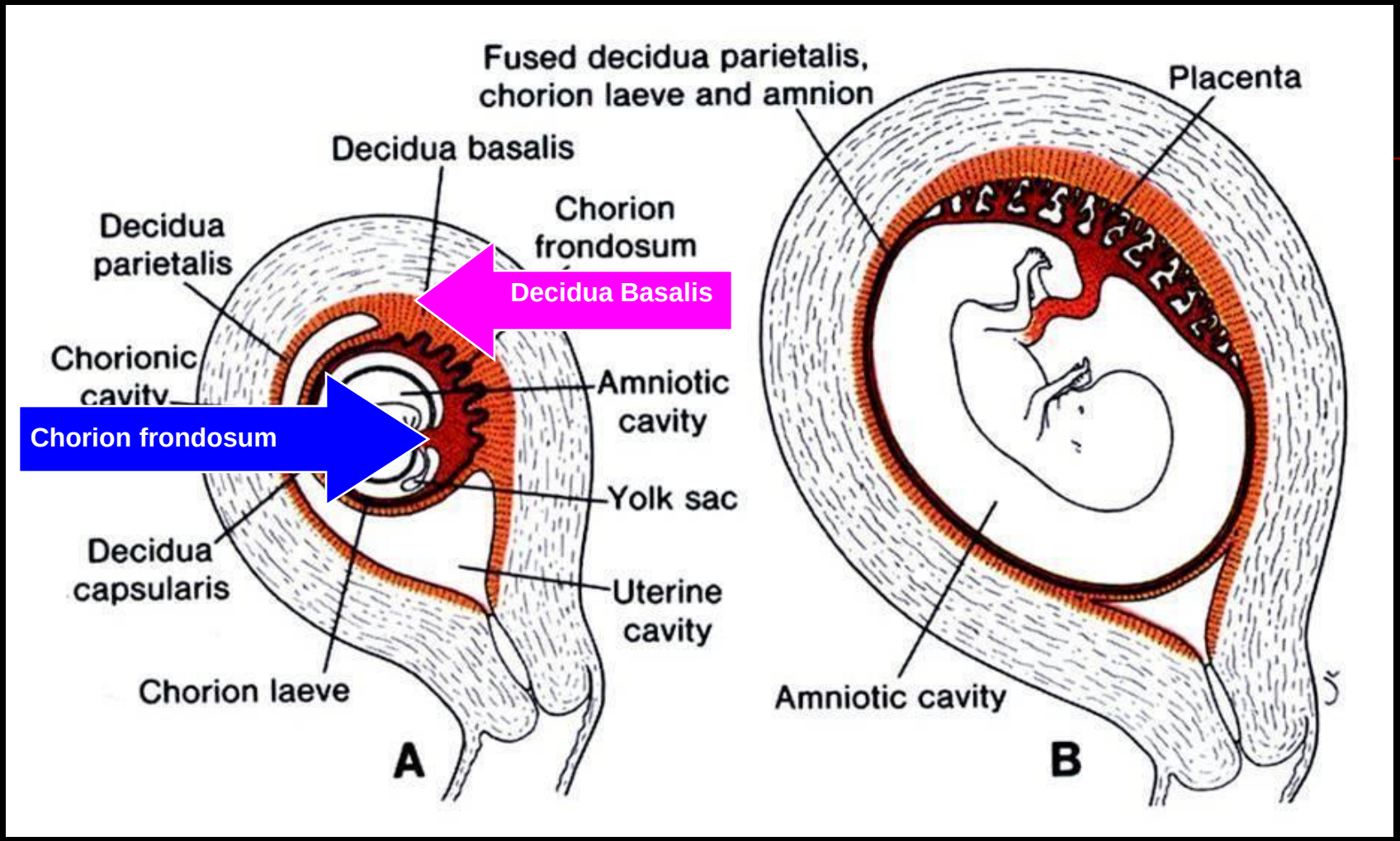
- Chorion frondosum and part of decidua basalis
- Decidua basalis— stratum spongiosum and stratum compactum
- Outer cell mass of trophoblast differentiate into 3 layers
  - Cytotrophoblast
  - Syncytiotrophoblast
  - Extra-embryonic mesoderm
- Eroding cytotrophoblasts create lacunae
- Lacunae develop into intervillous space
- Nitabuch's layer is a fibrinoid condensation of decidua preventing deep implantation of trophoblasts
- The functional unit is chorionic villus


Fused decidua parietalis,
chorion laeve and amnion
Placenta
Decidua basalis
Chorion frondosum
Decidua parietalis
Chorionic cavity
Amniotic cavity
Yolk sac
Decidua capsularis
Uterine cavity
Chorion laeve
A
Amniotic cavity
B


Trophoblastic lacunae
Maternal sinusoids
Syncytiotrophoblast
Cytotrophoblast
Endoderm cells
Extraembryonic coelom
Extraembryonic splanchnopleuric mesoderm
Extraembryonic somatopleuric mesoderm
Exocoelomic cavity (primitive yolk sac)
Exocoelomic membrane



The fibrinoid deposits form ...b-chorionic Langhans' layer A. Rohr's layer B is found at the level ... basal plate beneath the stem villi. Lying still deeper in the decidua b... they form Nitabuch's layer C. This is located at the boundary bet... the zona spongiosa and the zona compacta (where the releas... placenta takes place).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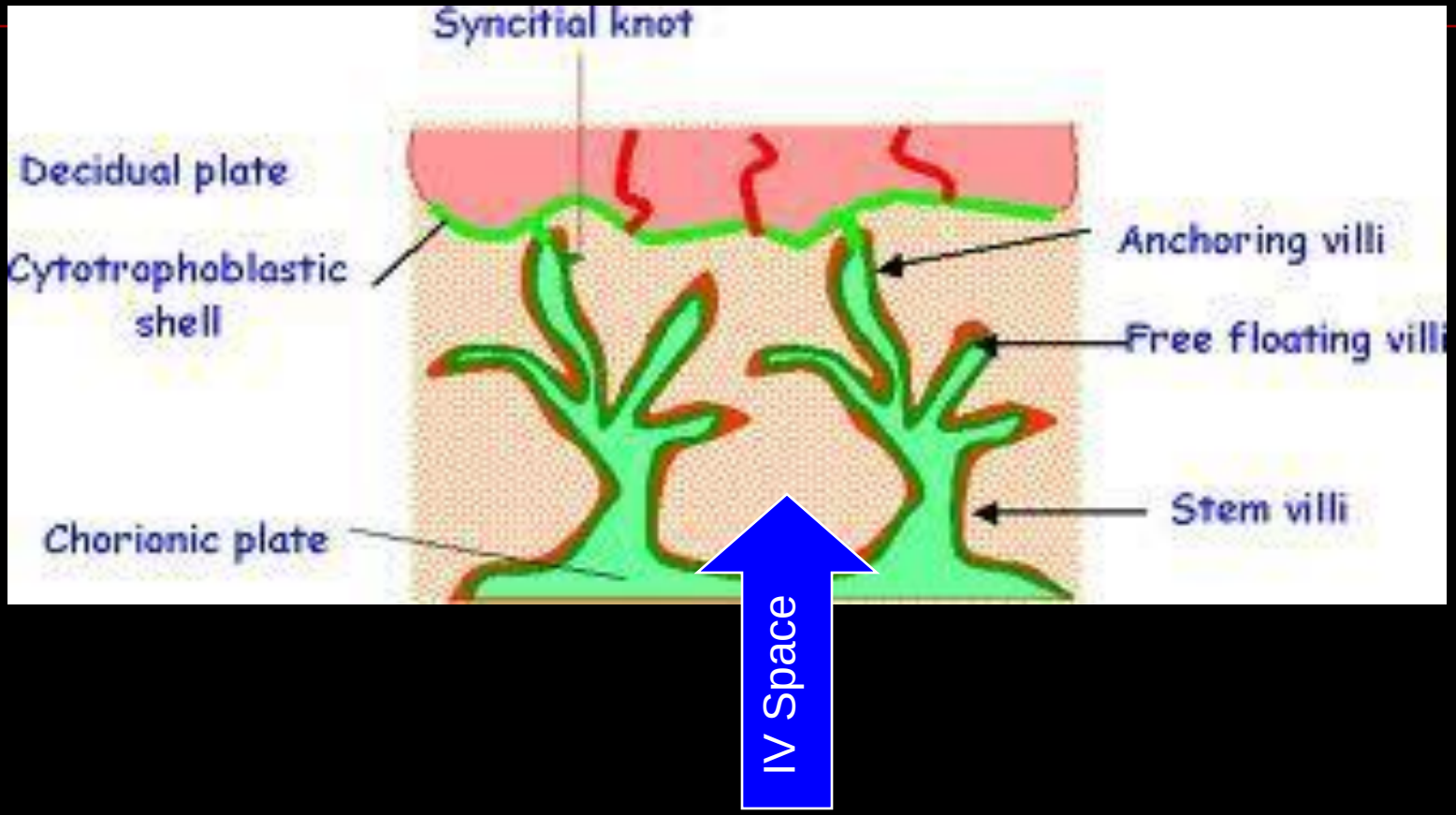
Placenta
Decidua basalis
Chorion
frondosum
Decidua
parietalis
Decidua Basalis
Chorionic
cavity
Chorion frondosum
Amniotic
cavity
Yolk sac
Decidua
capsularis
Uterine
cavity
Chorion laeve
Amniotic cavity
A
B

Chorionic villi

- 3 types—
  - Stem villi
  - Floating villi
  - Anchoring villi
- Floating villi—
  - Primary villi
  - Secondary villi
  - Tertiary villi


Syncitial knot
Decidual plate
Cytotrophoblastic shell
Anchoring villi
Free floating villi
Stem villi
Chorionic plate
IV Space

What is chorion laeve?
The degenerating chorion other than chorion frondosum

What is meant by primary villus?
Villus with cytotrophoblasts and syncytiotrophoblasts

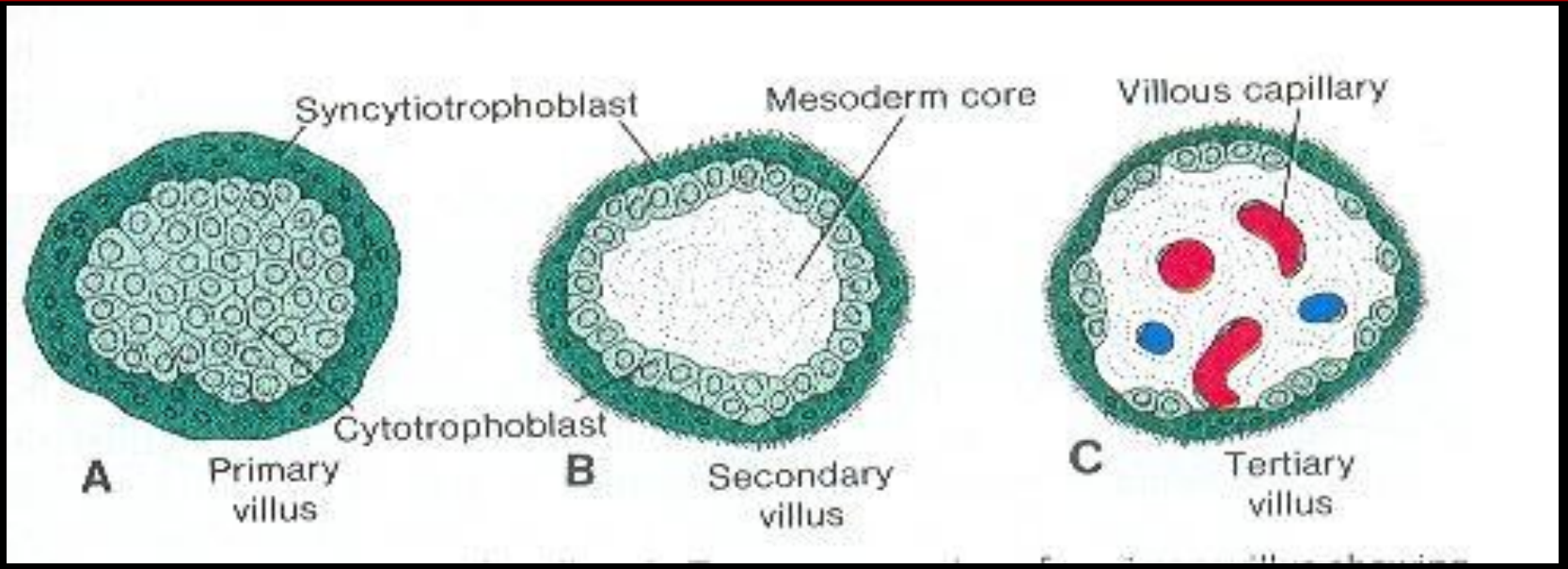
What is meant by secondary villus?
Primary villus and extra-embryonic mesoderm

What is meant by tertiary villus?
Secondary villus plus blood vessels

When does primary villus appear?
13th day of fertilisation

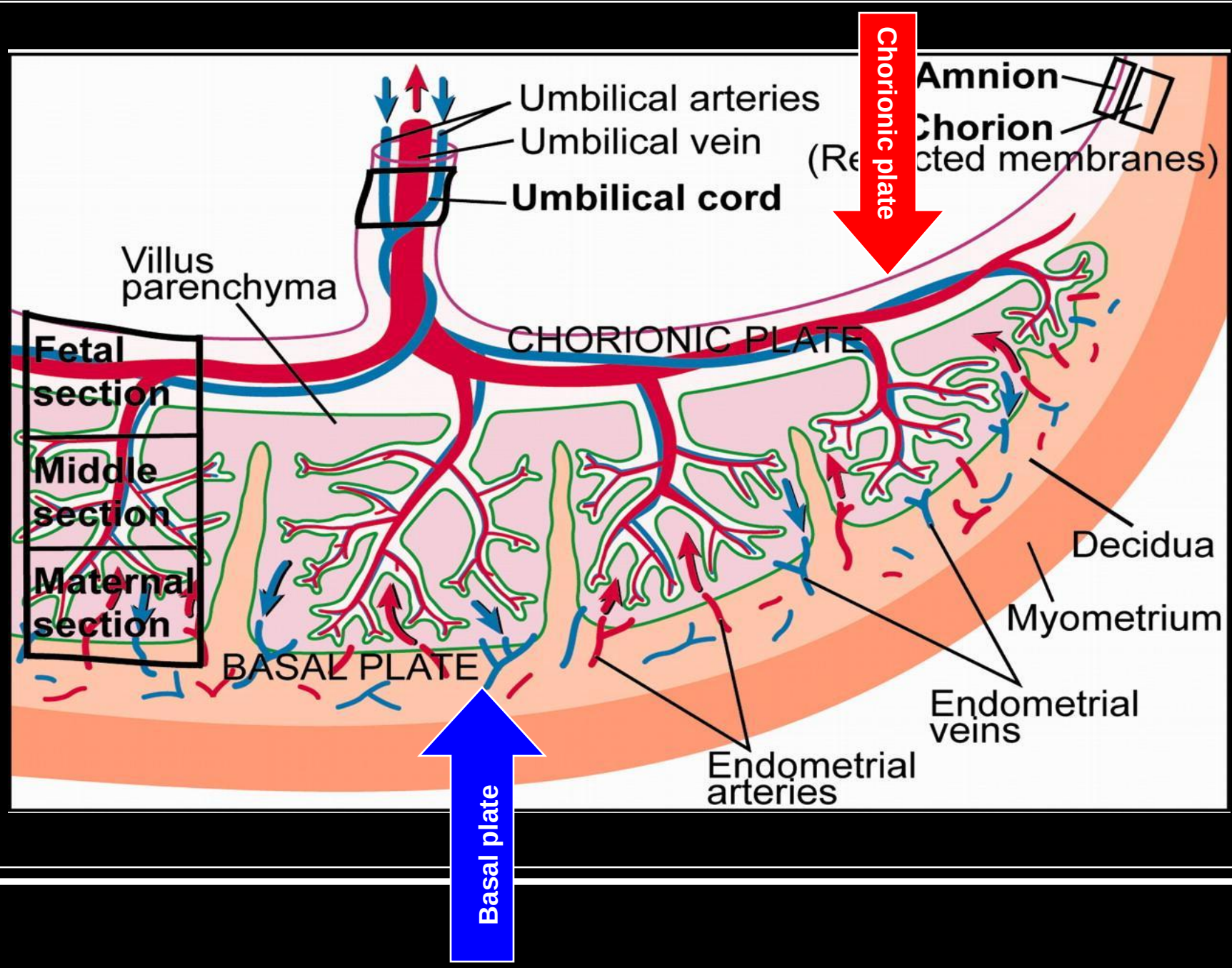
When does secondary villus appear?
16th day of fertilisation

When does tertiary villus appear?
21st day of fertilisation


Syncytiotrophoblast
Cytotrophoblast
A
Primary villus
Mesoderm core
B
Secondary villus
Villous capillary
C
Tertiary villus

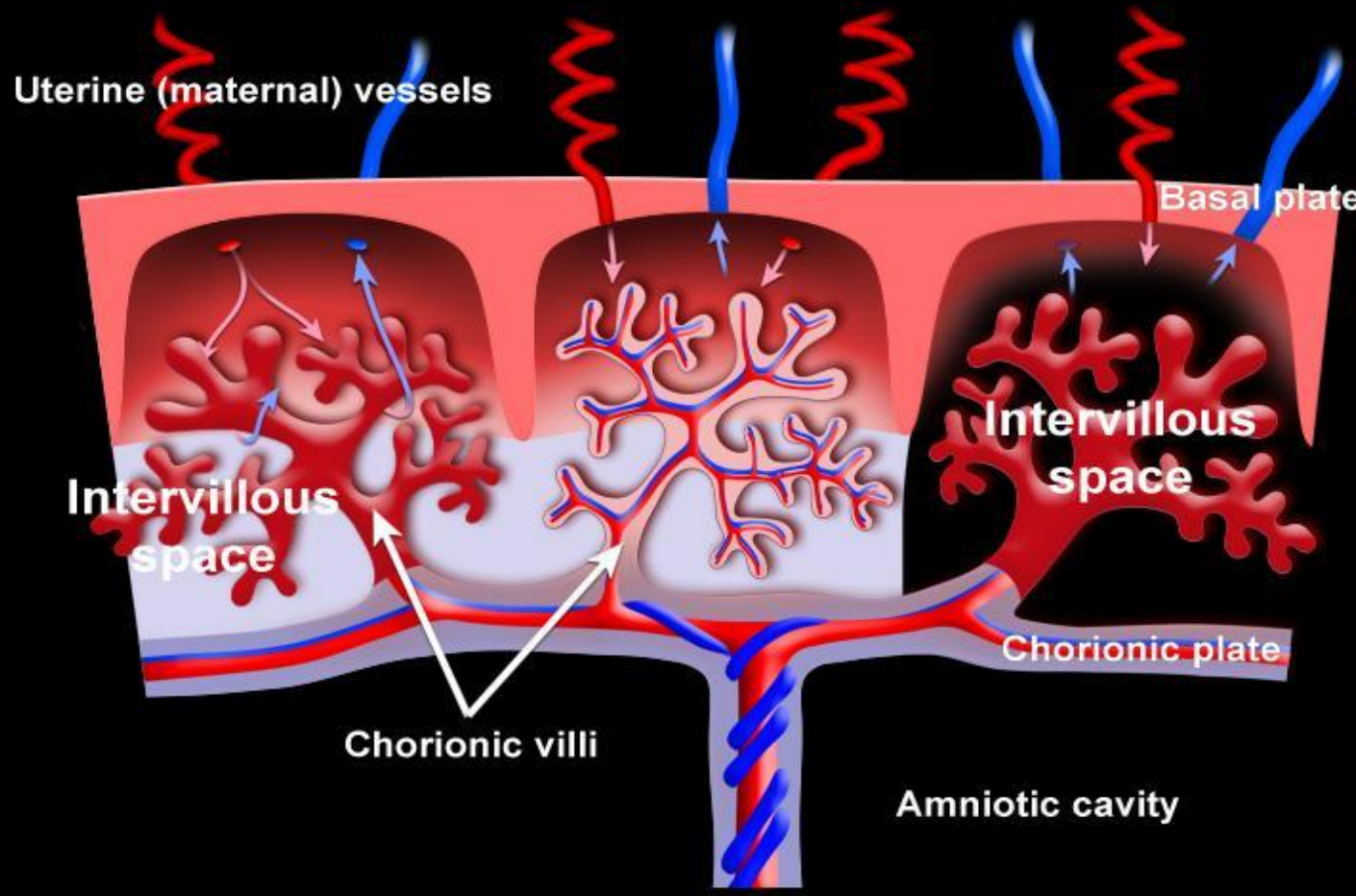
Mature placenta

- Mature placenta has—
  - Basal plate,
  - Chorionic plate,
  - Chorionic villi and
  - Intervillous space


Chorionic plate
Amnion
Chorion
(Re cted membranes)
Umbilical arteries
Umbilical vein
Umbilical cord
Villus parenchyma
CHORIONIC PLATE
Fetal section
Middle section
Maternal section
Decidua
Myometrium
BASAL PLATE
Endometrial veins
Endometrial arteries
Basal plate

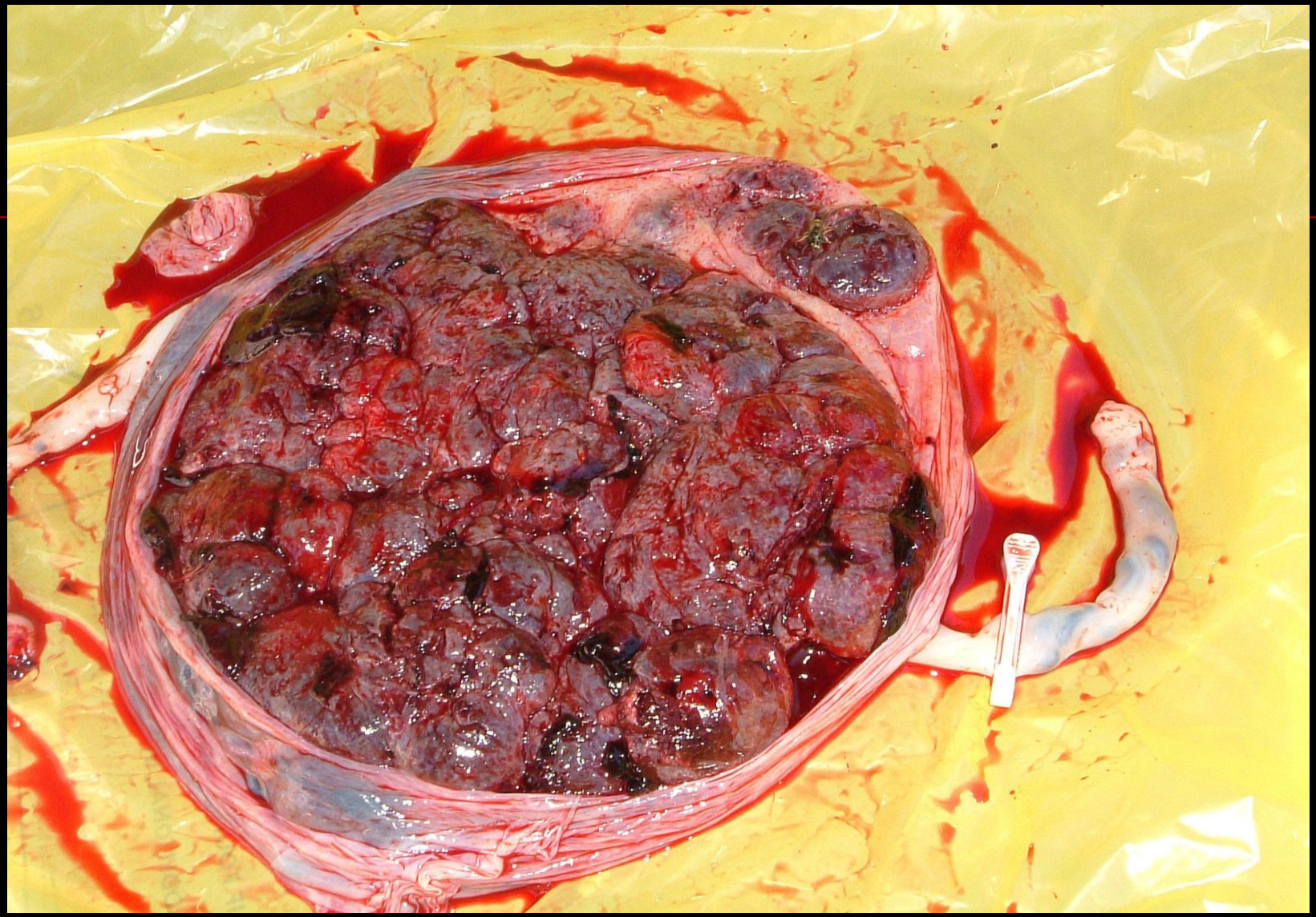
Intervillous Space

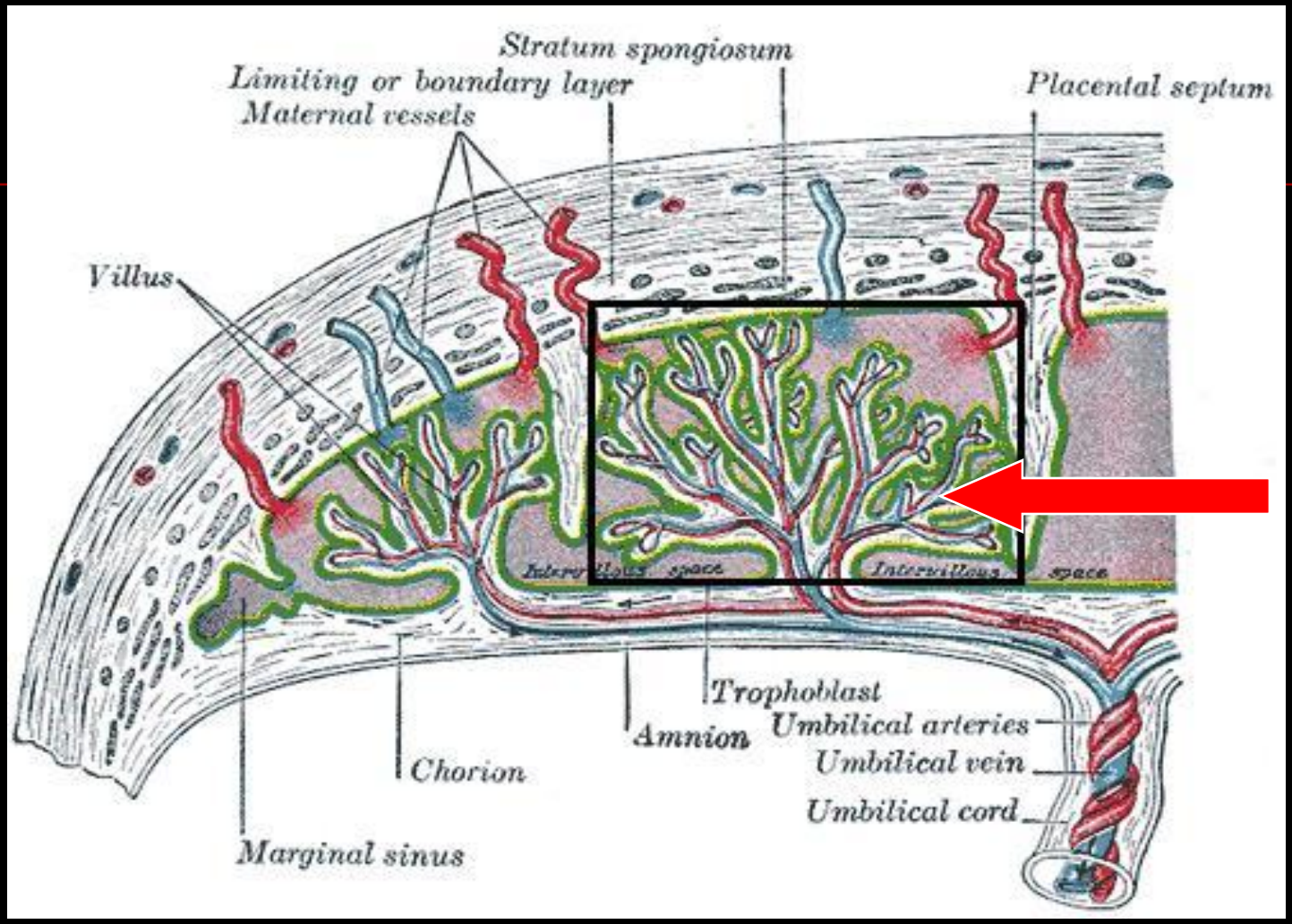
- It is lined on the inner side by chorionic plate
- Outside by basal plate
- Limited on the periphery by fusion of basal plate and chorionic plate
- It is lined internally syncytiotrophoblasts
- IV space is fed by spiral arteries and veins
- IV space is filled with maternal blood
- Chorionic villi are bathed in maternal blood like a reed in a swamp



What is meant by cotyledon?

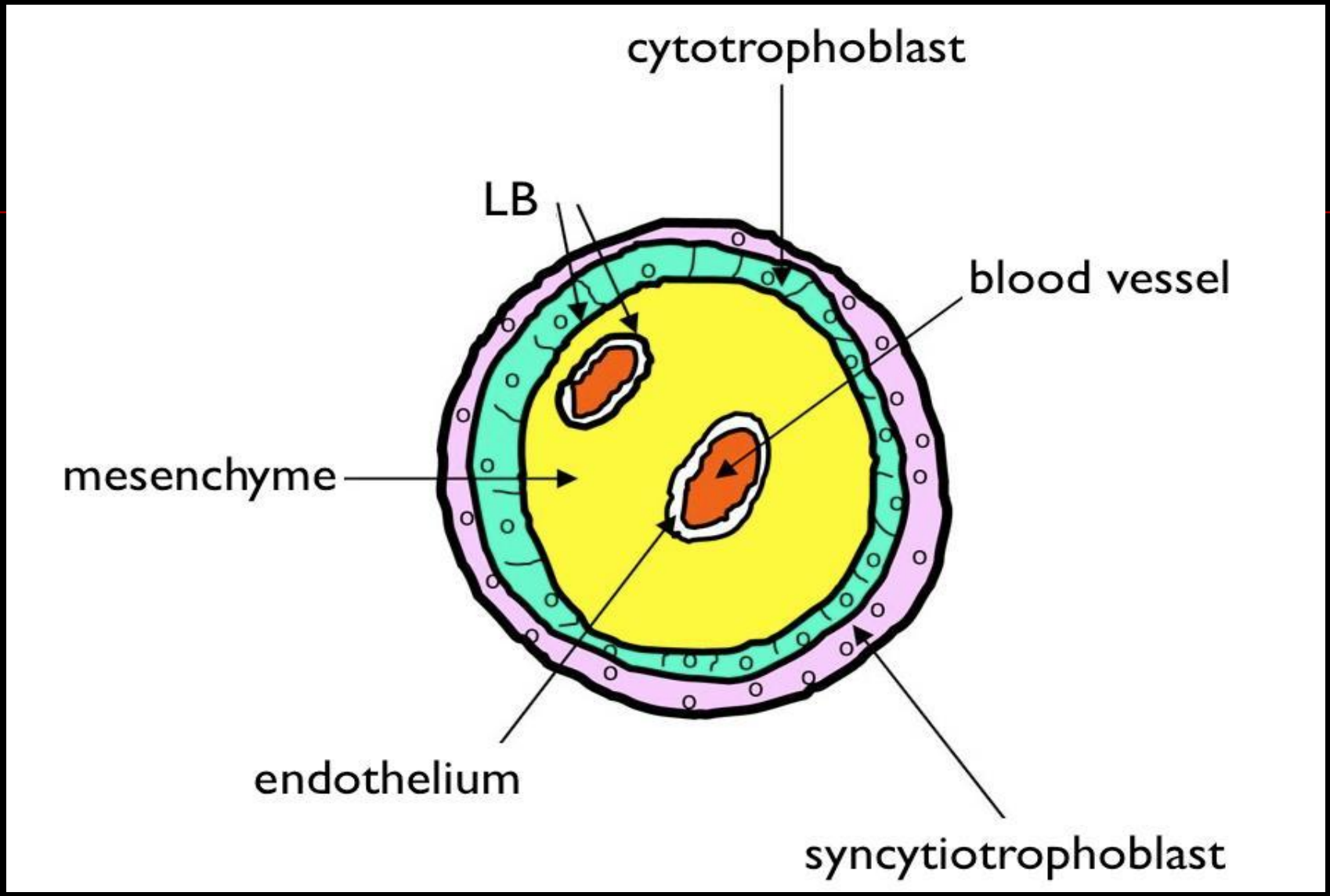
- Maternal surface of placenta is mapped out by polygonal areas known as cotyledons
- Each cotyledon contains one or two stem villi
- There are 15-20 cotyledons




Stratum spongiosum
Limiting or boundary layer
Maternal vessels
Placental septum
Villus
Intervillous space
Intervillous space
Trophoblast
Amnion
Umbilical arteries
Umbilical vein
Umbilical cord
Chorion
Marginal sinus

What is meant by placental barrier?

- Layers of cells separating maternal and foetal blood
- Syncytiotrophoblast
- Cytotrophoblast
- Basement membrane of cytotrophoblast
- Mesoderm
- Endothelium of foetal blood vessel
- Basement of endothelium


cytotrophoblast
LB
blood vessel
mesenchyme
endothelium
syncytiotrophoblast

What is the ratio of foetus and placenta?

- 6:1

Through which layer placenta separates?

- Decidua spongiosum

What is the weight of placenta?

- 500 mg

What is the thickness of placenta?

- 3 cm at the centre

What is the average length of cord?

- 50 cm

Define short cord?

- Cord less than 20 cm

What are the 2 components of placental circulation?

- Utero-placental and foeto-placental circulation

Describe utero-placental circulation

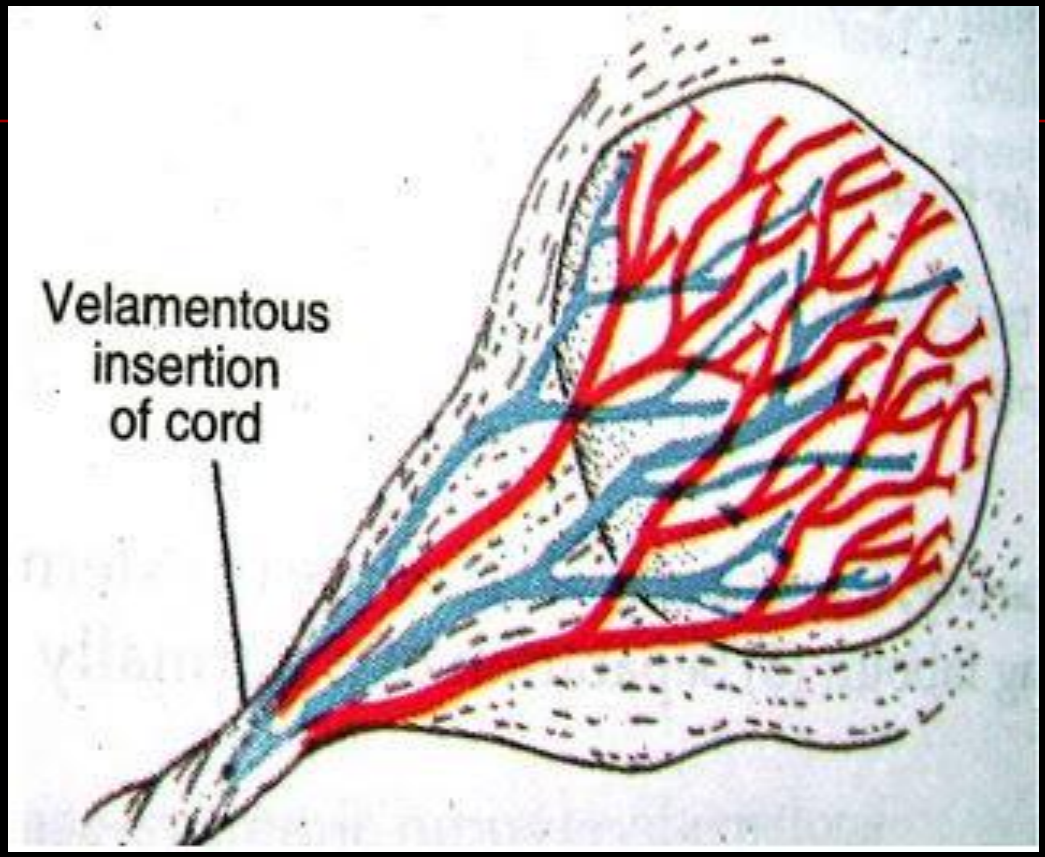
- It consists of IV space, spiral artery and vein and blood

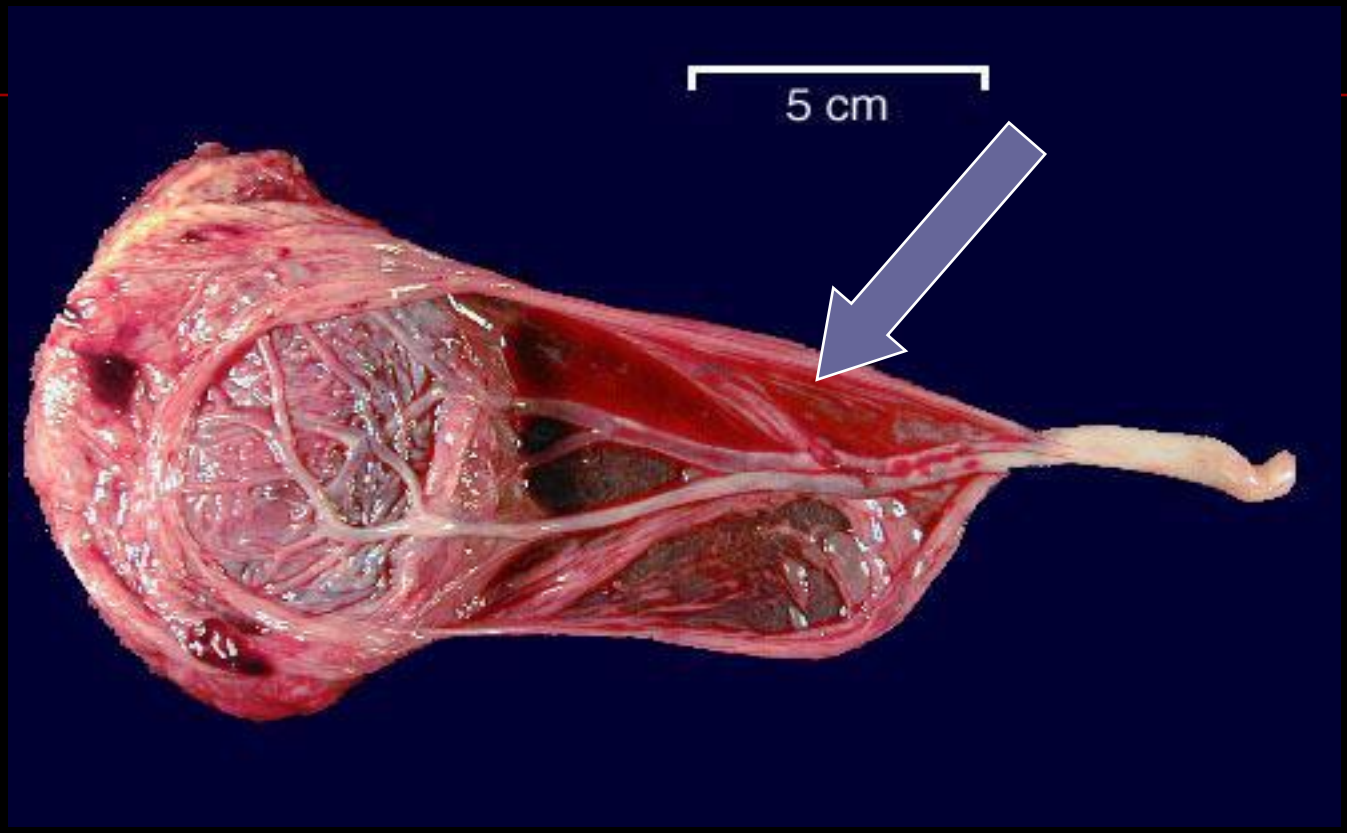
Describe foeto-placental circulation

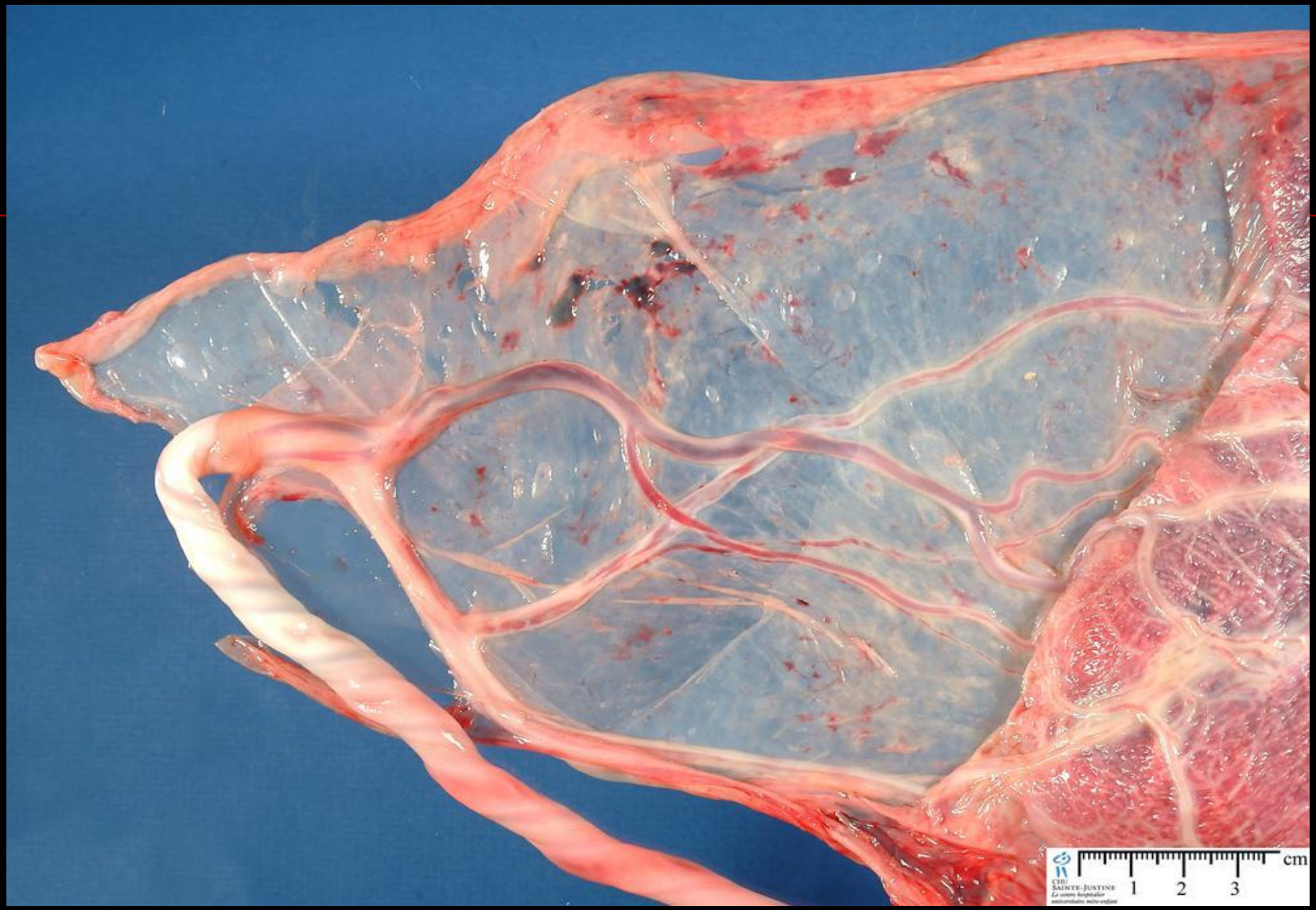
- 2 umbilical arteries and 1 vein
- Artery divides into primary, secondary and tertiary vessels
- Blood return to the vein through terminal capillary network or shunt

Name some abnormal placenta?

- Battledore placenta
- Velamentous placenta
- Placenta succenturiata
- Placenta praevia
- Circumvallate placenta
- Placenta accreta
- Placenta membranacea


Velamentous
insertion
of cord


5 cm


CHU
SAINTE-JUSTINE
1
2
3
cm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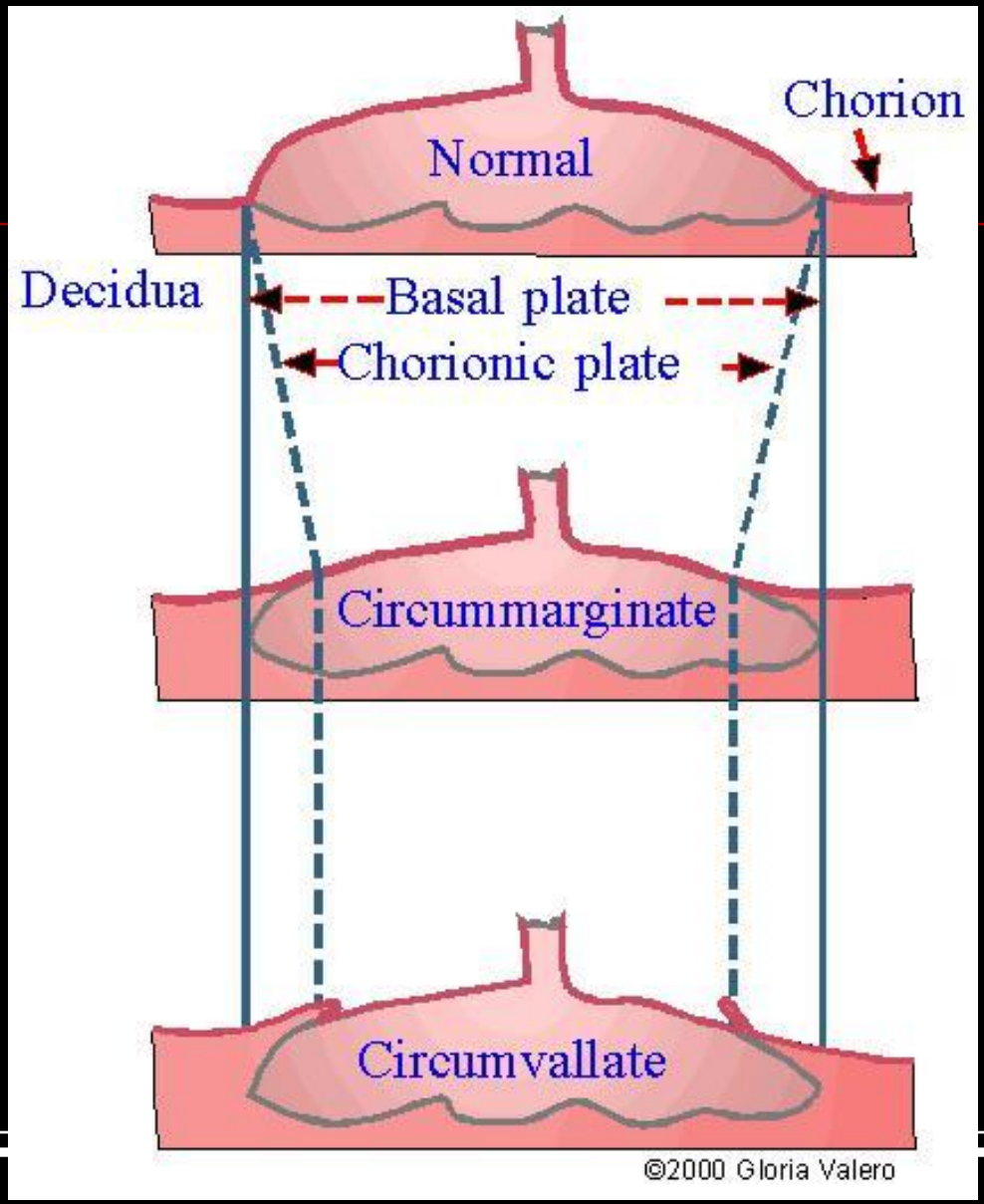
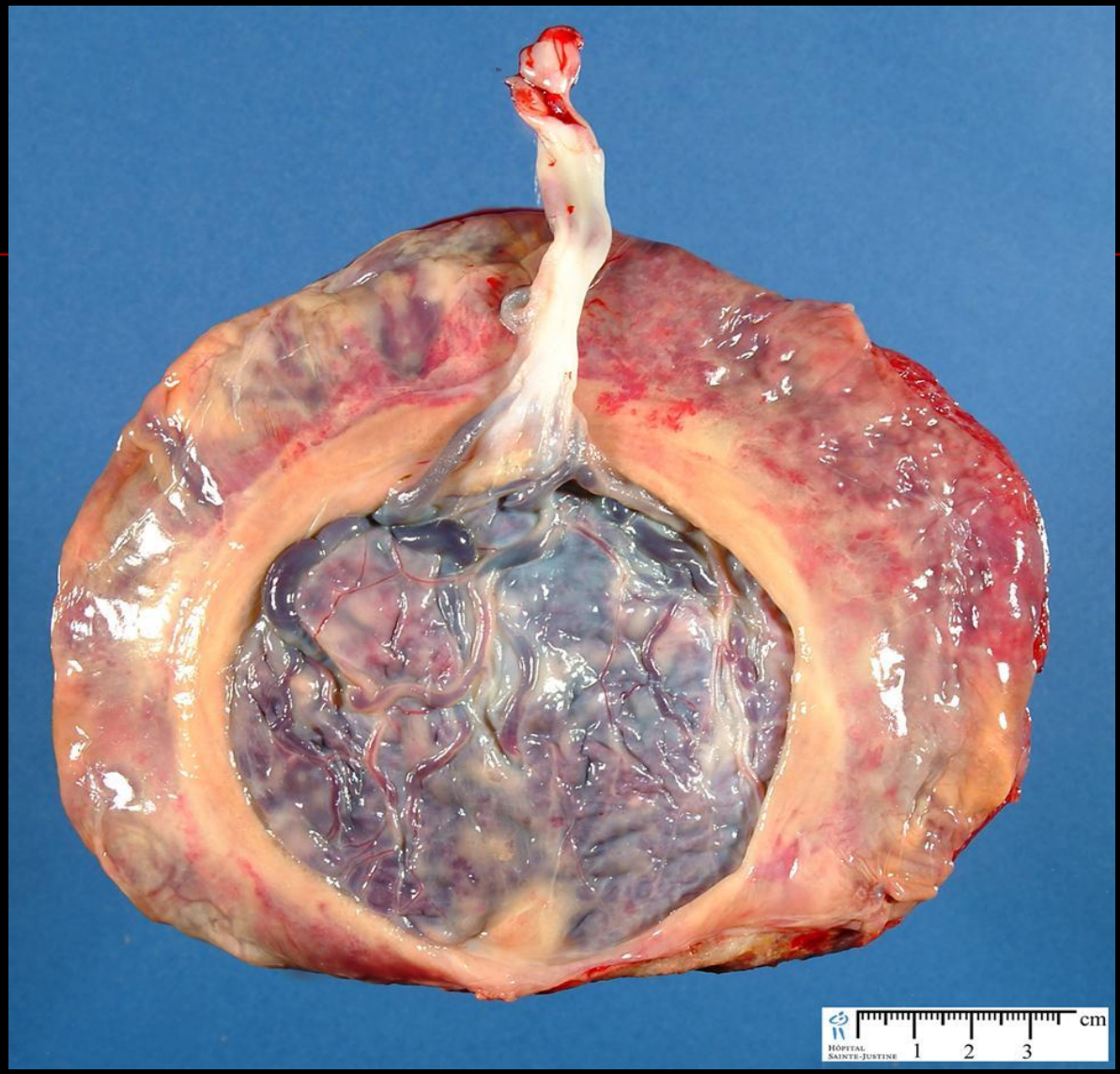
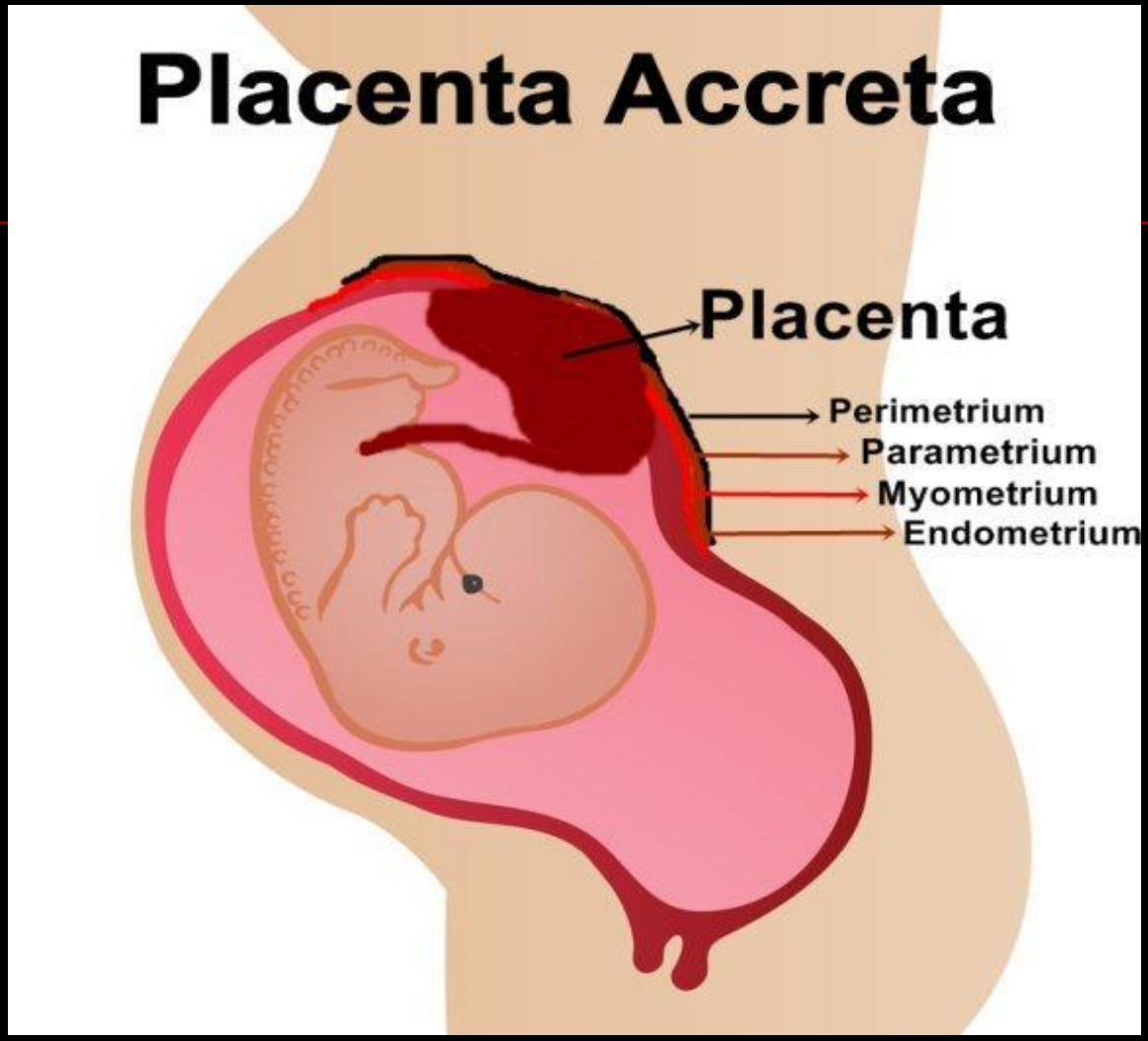
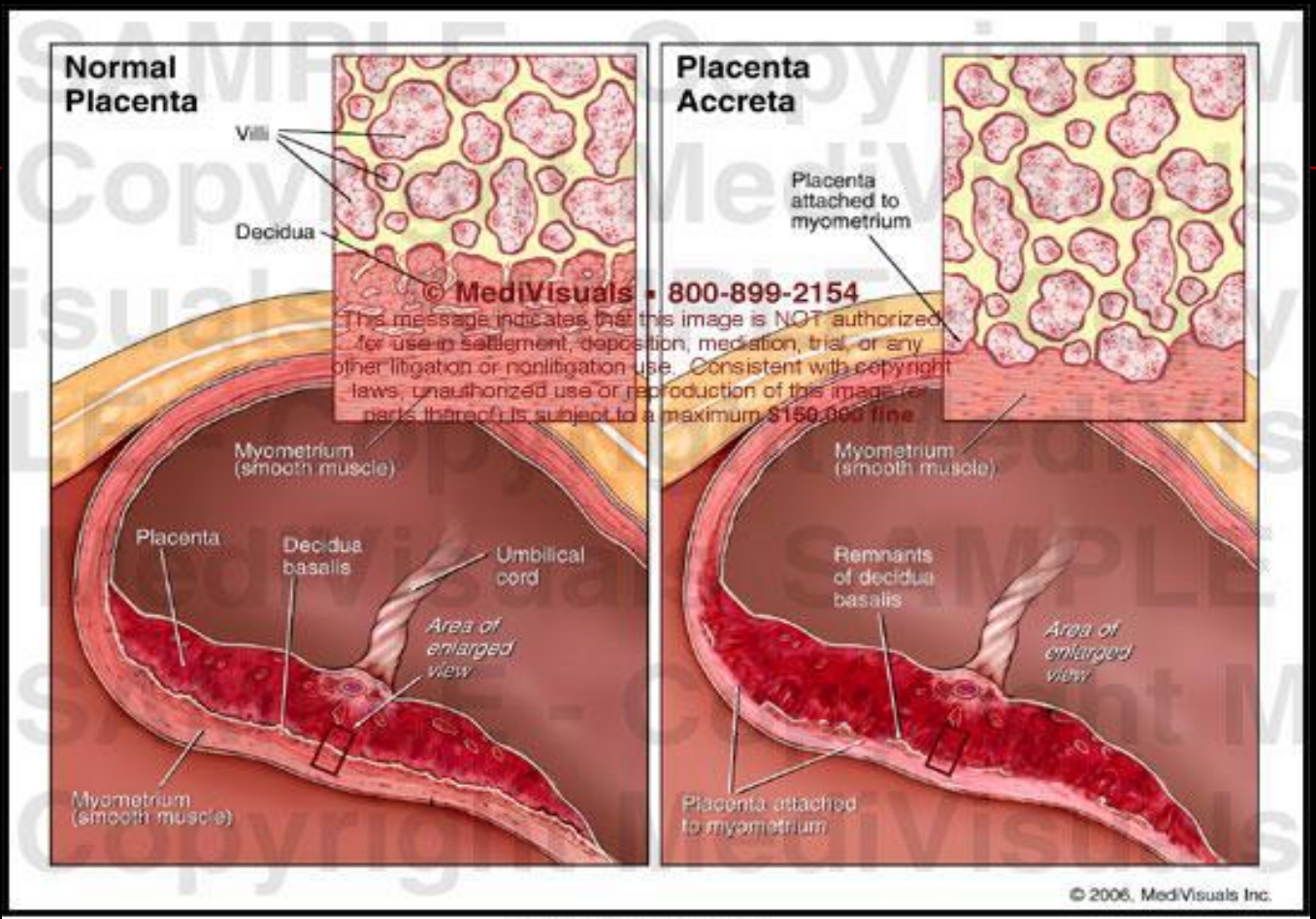

Chorion
Normal
Decidua
Basal plate
Chorionic plate
Circummarginate
Circumvallate
©2000 Gloria Valero


cm
1
2
3
Hôpital
Sainte-Justine


Placenta Accreta
Placenta
Perimetrium
Parametrium
Myometrium
Endometrium



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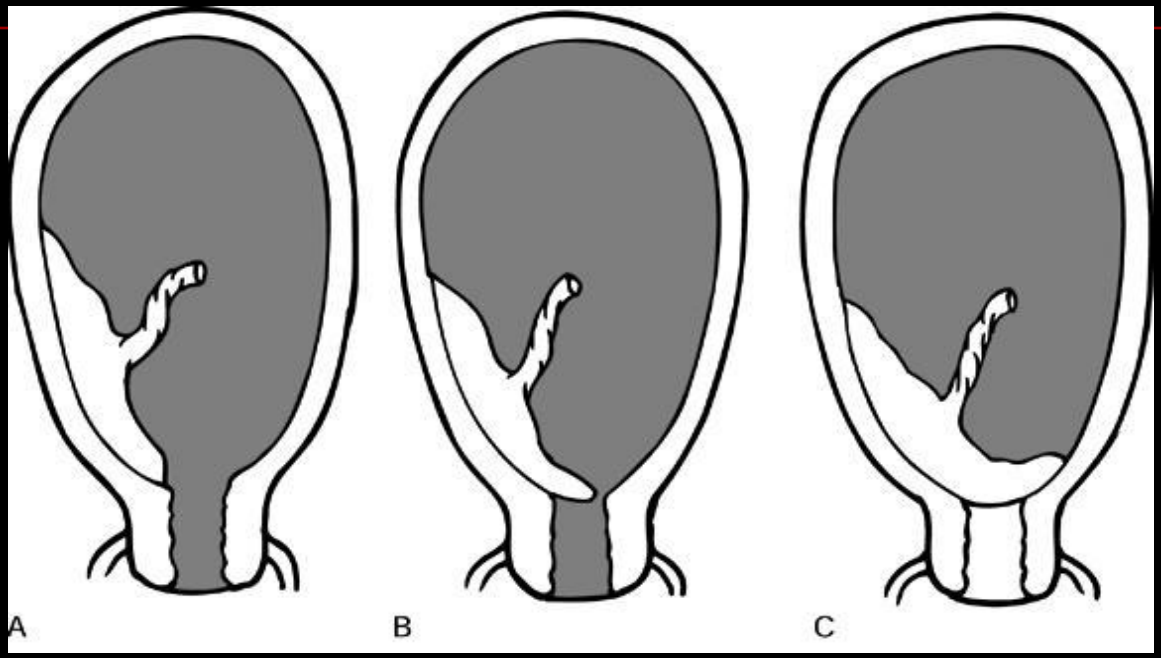
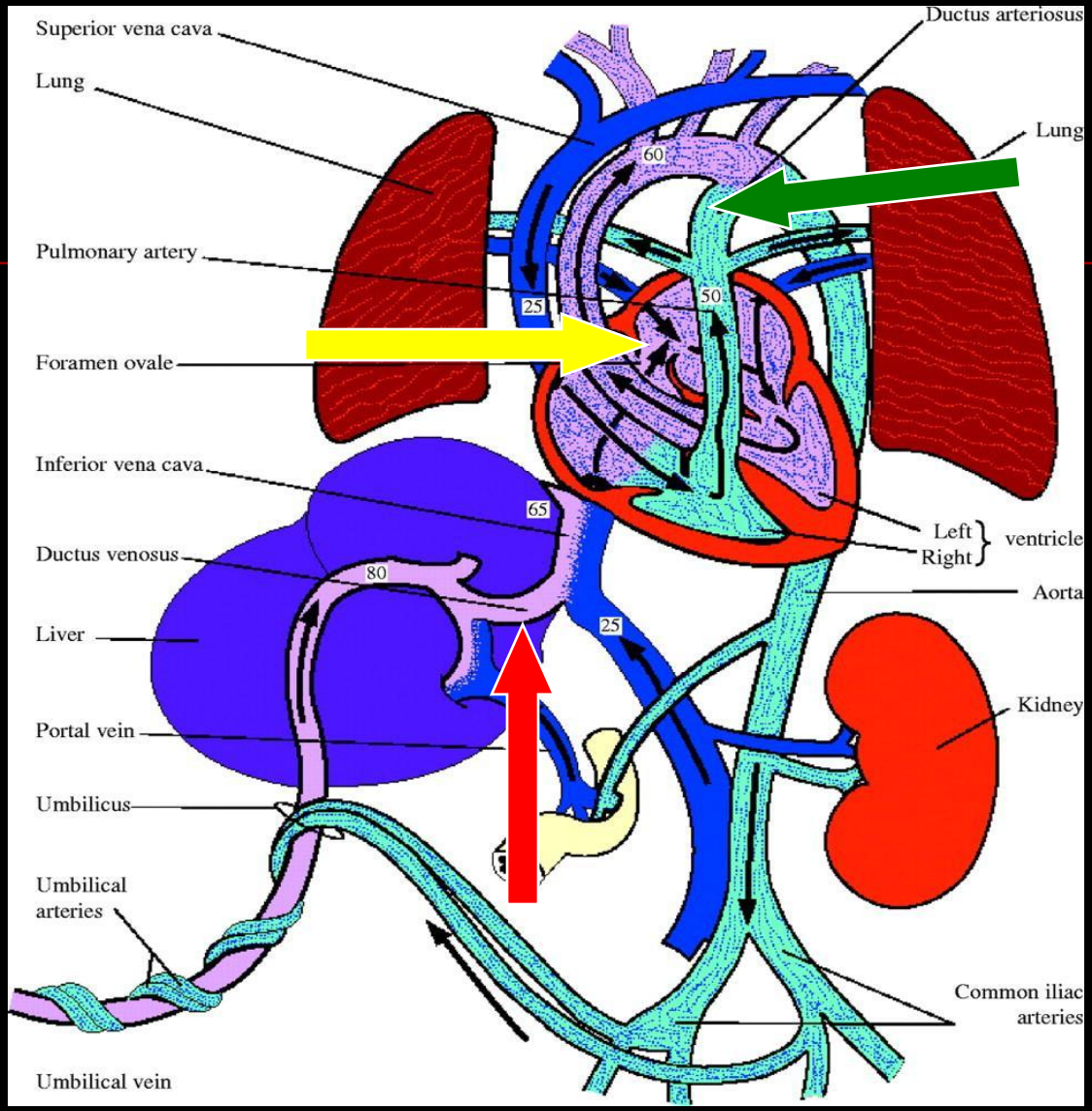

A
B
C


Superior vena cava
Lung
Pulmonary artery
Foramen ovale
Inferior vena cava
Ductus venosus
Liver
Portal vein
Umbilicus
Umbilical arteries
Umbilical vein
Ductus arteriosus
Lung
60
25
50
65
80
25
Left
Right
ventricle
Aorta
Kidney
Common iliac arteries

- From placenta blood is carried by umbilical vein
- Only 1 umbilical vein
- Right umbilical vein atrophies and left umbilical vein persists
- Umbilical vein joins the left branch of portal vein
- Majority of blood bypasses liver through ductus venosus
- Blood from IVC directly enters LA through Foramen Ovale
- Blood from left ventricle bypasses lungs through ductus arteriosus
- Blood returns to placenta by umbilical arteries
- Circulation after birth—
- Lungs change from solid to an expanded state
- Umbilical arteries—proximal part—remain open as superior vesical arteries
- Umbilical arteries—distal part—umbilical ligaments
- The umbilical vein forms ligamentum teres
- Ductus venosus forms ligamentum venosus
- Fibrosis takes place in the ductus arteriosus and forms ligamentum arteriosus
- Completion takes place 3 months
- Foramen ovale closes in 1 year

Physiology of pregnancy

- Normal uterus—(1 X 2 X 3) inches; weight 80 g
- Normal ovary—(1 x 2 x 3) cm; weight 20 g
- Uterus by term 1000g

- Isthmus develops to lower segment

CVS—

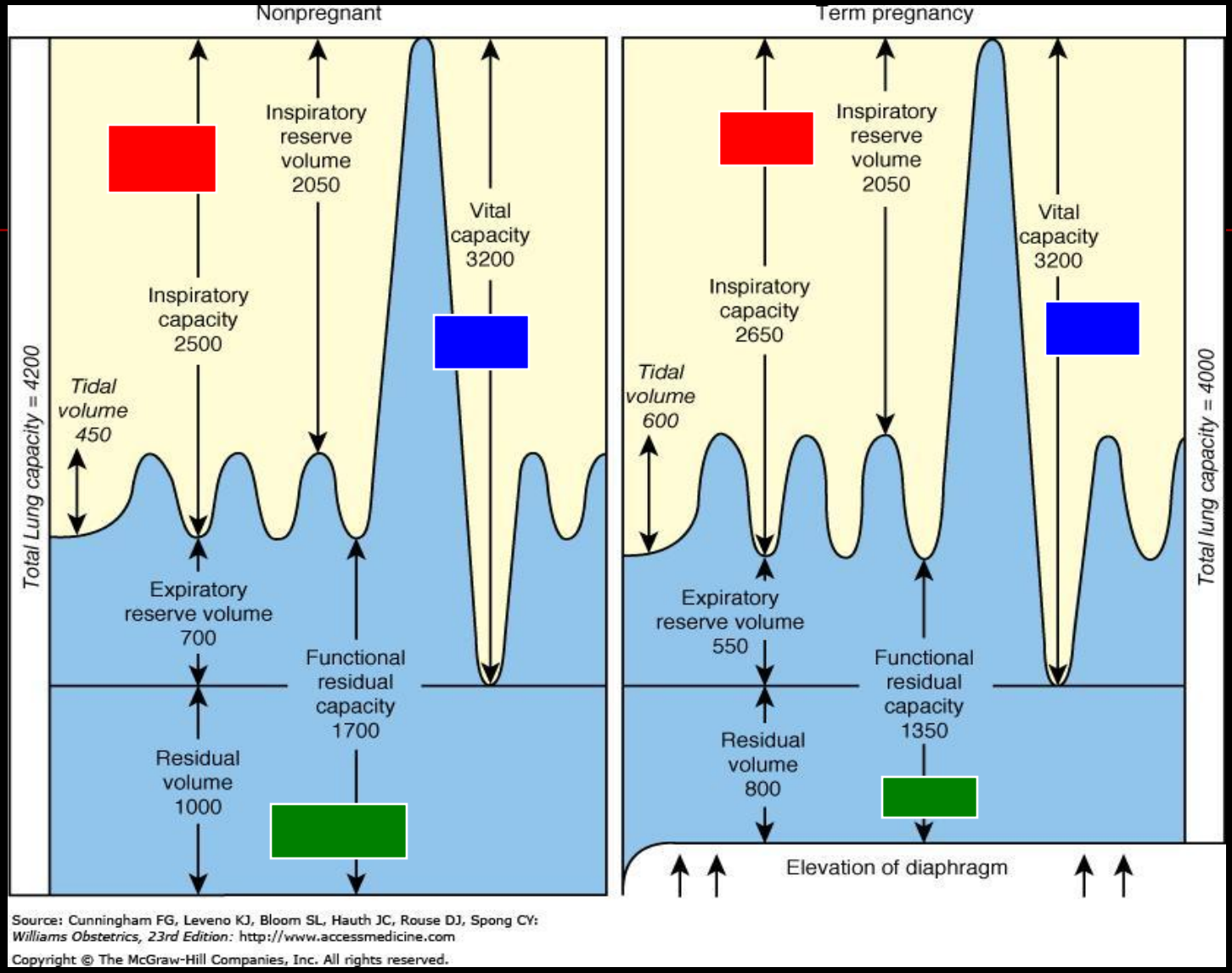
- CO increases by 50%
- Diastolic BP decreases by 15 mm Hg at mid pregnancy and returns normal in the 3rd TM

Haematological changes—

- Plasma volume increases by 40% and RBC volume 20%
- All coagulation factors except factor XI
- Physiological anaemia

Respiratory system

- Tidal volume increases
- Inspiratory capacity increases
- Vital capacity unchanged
- Functional residual capacity decreases
- Reduction in maternal pCO_2



Renal system—

- Dilatation of ureters
- More chance of UTI
- Increased frequency of urination in the 1st and 3rd trimester
- GFR increases by 50%
- Renal glycosuria
- Microproteinuria

Hormones in pregnancy—

hCG produced by syncytiotrophoblast

- Peak level at 70 days
- Otherinportant hormones—
  - Oestrogen
  - Progesterone
  - hPL

GIT—

- Gingival hypertrophy of pregnancy
- Decrease in gastrointestinal motility
- Relaxation of pyloric sphincter
- Delayed gastric emptying
- Constipation
- Delayed emptying of gall bladder
- Recurrent cholestasis of pregnancy

Skin—

- Chloasma of pregnancy

Other changes—

- Waddling gate of pregnancy
- Carpal tunnel syndrome